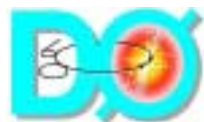


ICD Status

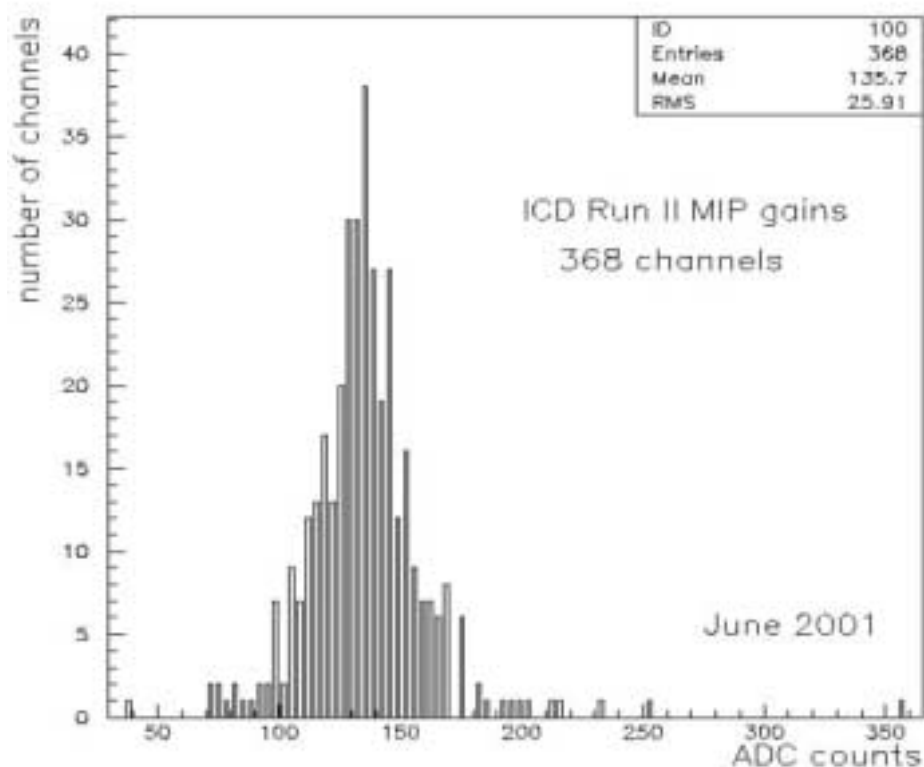
- ADC to GeV Conversion
- cal_examine Plots
- Mapping
- Other issues

Based on investigations by Alan Stone, Andy White, Leo Chan, Dean Schamberger, Lee Sawyer, Vishnu Zutshi and Bob Kehoe

Alan L. Stone
Louisiana Tech University
DØ Collaboration Meeting

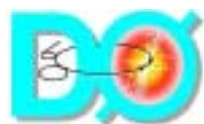


ICD Cosmic Ray Test Stand Results



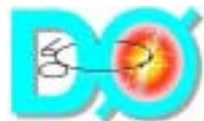
**Average MIP Peak (368 channels)
from data taken in Spring 2001
was 135.7 ADC Counts.**

- Convert Test Stand ADCs to DØ Calorimeter ADCs
 - Used CAL instead of ICD type preamps
 - Better separation between pedestal and MIP peak
 - Test stand signal boost by factor of 8.7
 - Least count of test stand ADC was 1 mV & for Calorimeter it is 0.1 mV



ADC to GeV Conversion

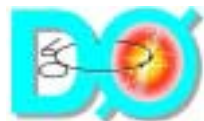
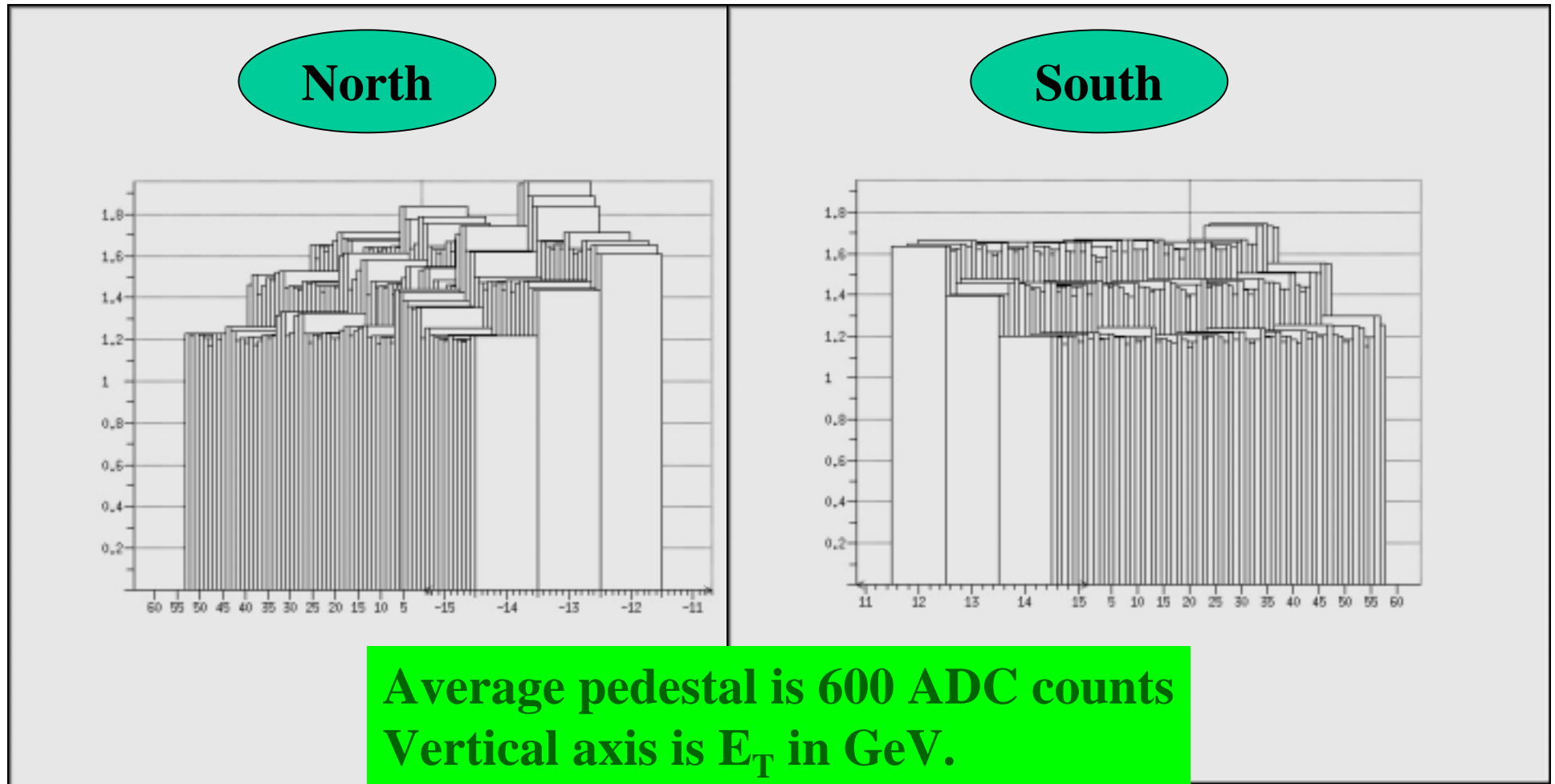
- Average MIP peak in Calorimeter ADCs
 - $[135.7 \times (1.0/0.1)] / [(22.5/5.5) \times 8.7] = 38.13$ ADC counts
- $dE/dx_{\min} = 2.02$ MeV/cm (*PVT Scintillator*)
- Energy deposition in ICD tile
 - $[(\text{CAL ADC counts}) / 38.13] \times (2.02 \text{ MeV/cm}) \times 1.27 \text{ cm}$
 - $(\text{CAL ADC counts}) \times (0.0000673) \equiv [\text{Energy in GeV}]$
- Correct for flipped resistors (*factor of 32/23*)
 - $(\text{CAL ADC counts}) \times (0.0000936) \equiv [\text{Energy in GeV}]$
 - Current factor in plt_latest.rcp is 0.0000694
 - This would increase the ICD energy reconstructed by 35%!
 - Assume for now that the weights are correct



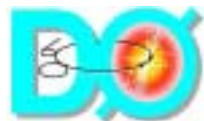
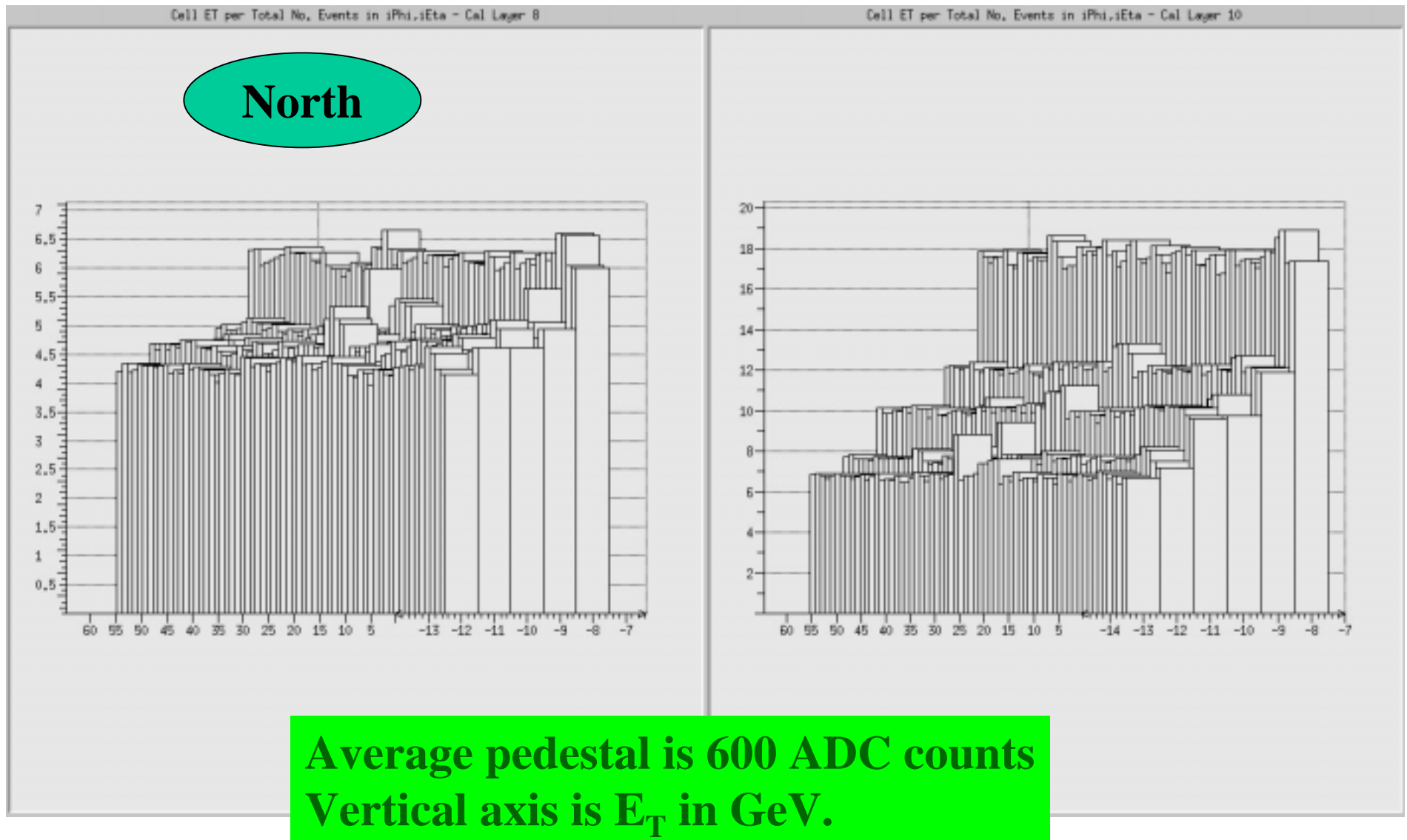
What do we see in cal_examine for ICD?

Current version is t02.08.00

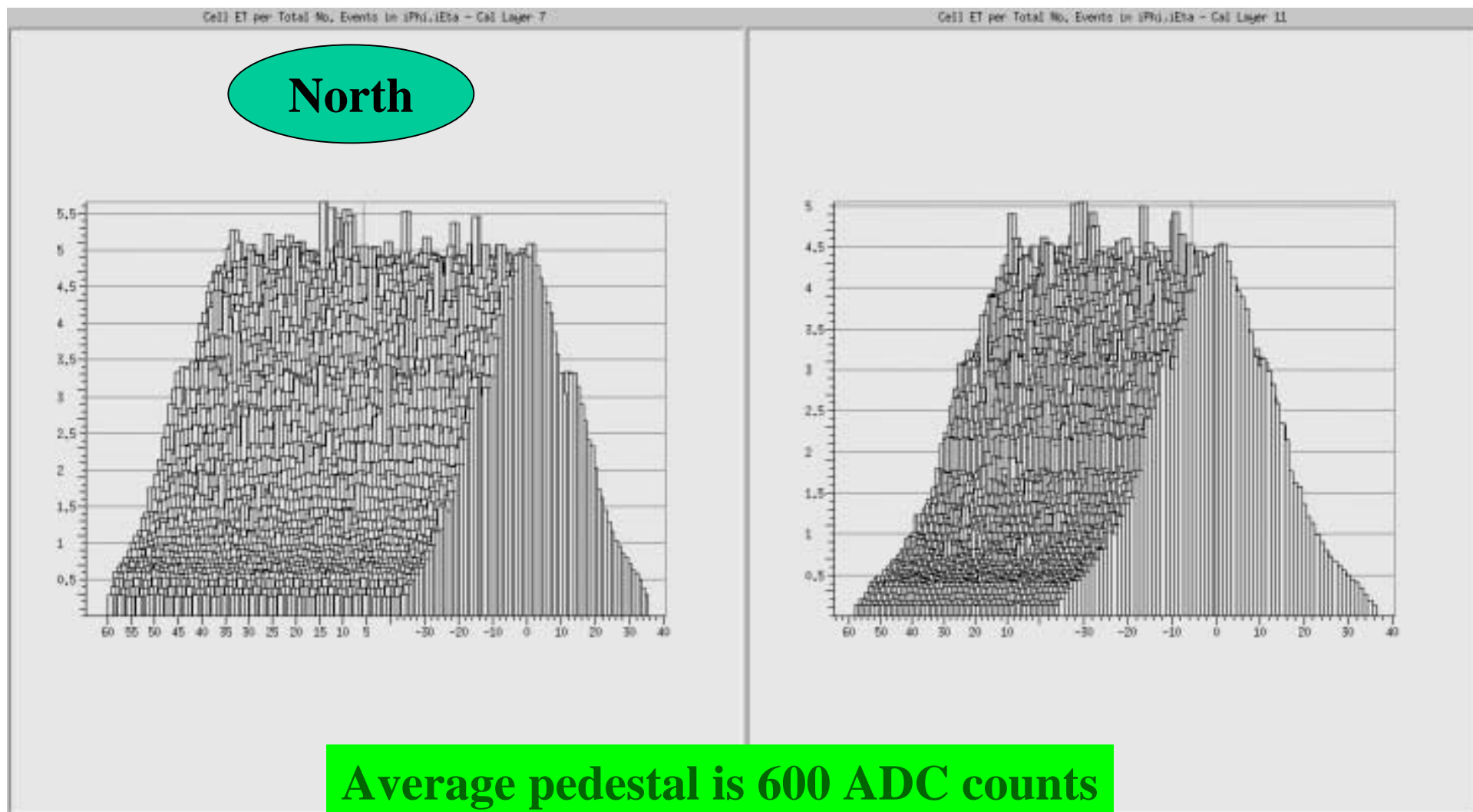
Took zero bias run, in normal, unsuppressed mode.



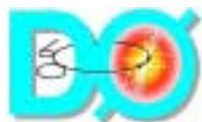
What do we see in cal_examine for MG?



And neighboring CAL layers...

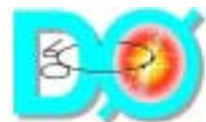


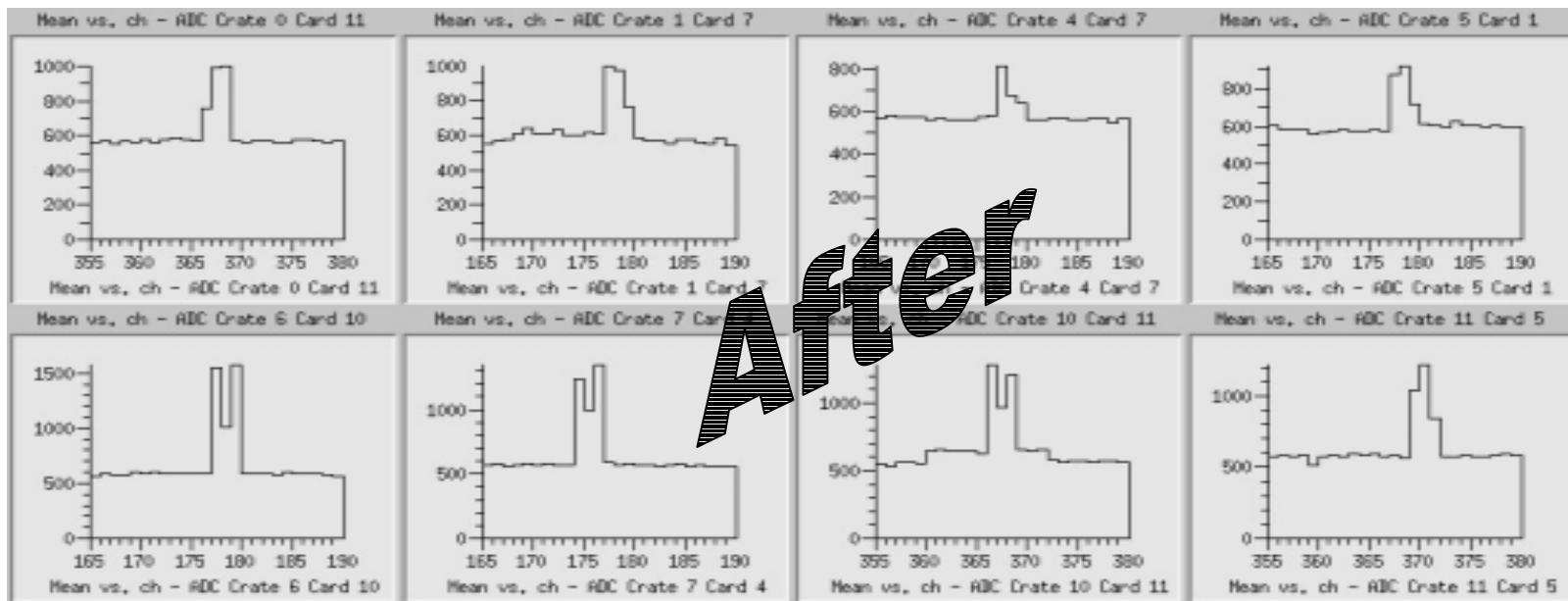
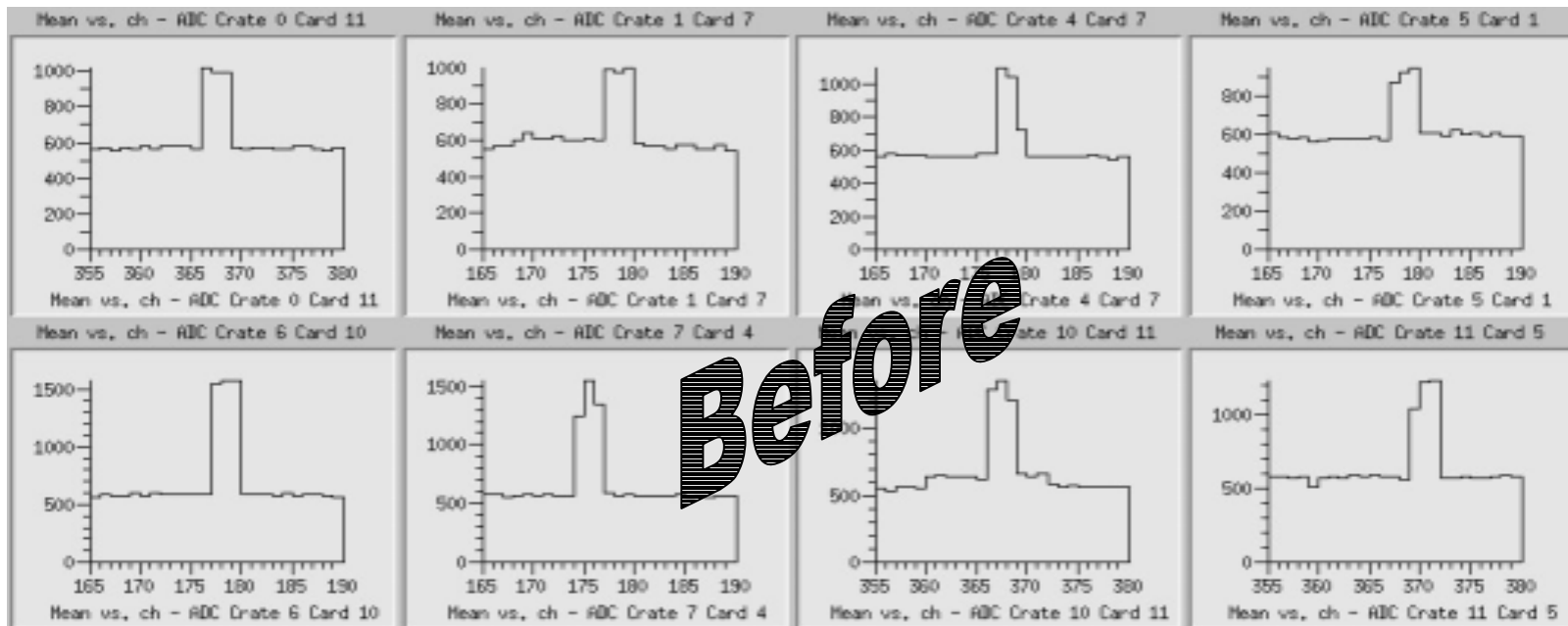
Average pedestal is 600 ADC counts
Vertical axis is E_T in GeV.



Address Changes in Software

- Current Reco version on farms is p10.15.01
 - *caltables*: plt_latest.rcp \Rightarrow tag p10-15-01
 - Most recent, but it is using $1/20000 \times (32/23)$ for ICD
 - *caladdress*: CPreAChan.cpp \Rightarrow tag p10-05-00
 - Correction to ICD fiber backplane miscabling not tagged for production release
 - Eta is swapped (12 \leftrightarrow 14) for the NE & SW quadrants
- New problem was found a few weeks ago
 - All channels in West are phi swapped in output of cal_examine (*but not in cal_elec*)
 - Sent email to Bob Kehoe - not sure if this is a bug in caladdress, or if the problem is internal to the online version of cal_examine

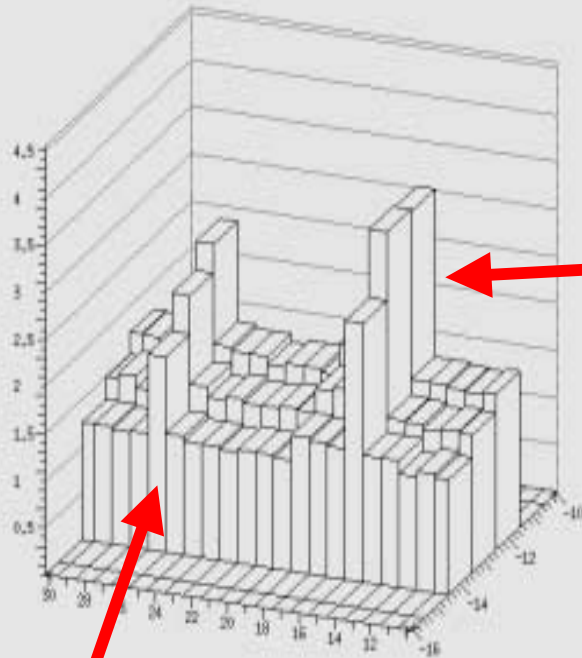




Turned on ICD LED pulser. Turned off all HV except for channels shown. Reduced by 50V for a single channel in each group of three (each Calorimeter readout crate in which the ICD resides). Referenced ICD channel map. cal_elec is correct.



Before

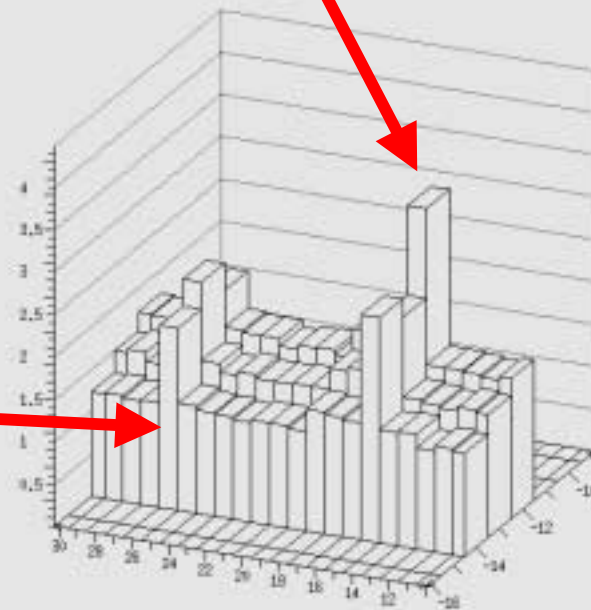


**CAL crate 1 (ICD NW12) &
CAL crate 11 (ICD NE16)**

**cal_examine gives
correctly $\phi = 15$.**

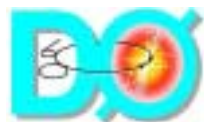
**cal_examine gives
incorrectly $\phi = 26$
Should be 25.**

After



Other Issues That Need Attention

- Isolated muons tracked through ICD
 - Verify MIP response in ADC counts
 - Channel to channel correction
- SCA non-linearity effects
 - Small contributions from ICD tiles to jets
- Calorimeter geometry
 - ICDmodule.hpp/cpp last modified 9 Aug 2000
 - Has anyone independently checked on this?
 - D0scan – different color scheme for ICD
 - George Alverson is currently working on this



Summary

- ICD electronic output is working well
 - cal_elec addressing is as expected
 - Verified with LED pulser
 - Only a handful of weak or dead channels
 - New PMTs are on hand & being tested
 - New motherboards are also at D0
 - We need to wait for major shutdown to get time & access to the East/West platforms
- ICD response is at the mercy of the software
 - We need to get into p11 right away:
 - Corrected addressing
 - Corrected ADC to GeV conversion

